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Accounting Information System (AIS) Alignment and Non-financial Performance in Small Firm: A Contingency Perspective

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Abstract. Accounting Information System (AIS) is very important for Small and Medium Enterprises (SMEs) because it can provide information for the owner in decision making. In line with the result of previous study, which find that AIS alignment is needed because it will affect company performance. This study aims to test the direct relationship and mediating relationship among three contingency variables of AIS alignment on non-financial performance. This study employs questionnaire with 87 SMEs owner in Yogyakarta region as samples. The results show that AIS sophisticated, owner commitment affect non-financial performance, either directly or mediated by AIS alignment. This study implies that AIS is very essential for SMEs to survive in a very competitive environme.

Keywords: Accounting information system · Alignment
Non-financial performance

1 Introduction

Previous researchers has try to explain the effect of information technology[1] (IT) implementation in Small and Medium Enterprises (SMEs) [1–4]. The study that investigates the implementation of IT in SMEs is very important Grande, [5] for the following reasons: first, there are differences between SMEs and large firm in IT adoption and

[1] Refer to previous study that found that accounting information system has the same terminology with Management Accounting System (MAS) Management Information System (MIS), accounting information system which is the part of information technology [15, 16].

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implementation [6]. Second, company needs a large sum of money to make a design, test, and implement IT Lim *et al.* [7], while the limitation in budget is the main problem faced by SMEs [8]. Third, even though SMEs owner realize that performance measurement is an important activity, however they may not use it properly [9]. The contingency perspective explains that organizational performance is affected by internal factors [10]. In line with the argument, Hussin *et al.* [11]; Ismail and King [12] explain that SMEs performance is affected by alignment between capacity and IT requirement. Furthermore, Ismail and King [13]; Al-Eqab and Ismail [14] prove that IT alignment is affected by organizational factors such as AIS sophisticated and owner commitment, and situational factor that is external IT expertise [11]. The SMEs need AIS sophisticated to face market competition [3], to facilitate the realization of objectives [17], provide flexibility in developing strategy, especially in facing consumers' demand [18]. Besides that, SMEs also need owner's commitment in implementing the IT; the more committed the owner, the implementation of technology will be easier [19]. The SMEs owner who have commitment will realize that IT is very important for SMEs to survive [20]. In addition to AIS sophisticated and owner commitment, external IT expertise becomes another important factor for SMEs in IT implementation [11]. Human resources limitedness makes external IT expertise is needed for SMEs because assistance from the experts in IT may decrease risk and facilitate and fasten IT implementation in SMEs [20, 21].

This study aims to test direct relationship between AIS sophisticated, owner commitment, external IT expertise, and non-financial performance, as well as the indirect relationship among the variables mediated by AIS alignment. This study results are important for SMEs owner so that they can plan and select the IT that meet their capacity and requirement. This study employs non-financial performance measurements because financial performance has a limitation that is it reports short-term performance and not a prediction for long-term performance [22]. Financial performance such as cost efficiency tends to push managers to commit moral hazard in order to maximize their profits [23]. Thus, to support and evaluate the success of organization, Harrison and Pole [24]; Choe [22] proposes the usage of non-financial performance measurement. Non-financial performance represented by service quality will leads to the increase in cost, thus reducing profitability [25]. However, non-financial performance measurement may provide several benefits such as quality improvement and faster delivery [16, 26, 27]. Zuriekat *et al.* [28] explain that the measurement of financial and non-financial performance has a different role in supporting company's operation. Financial measurement is more suitable to be used in organization that has multiple departments, but it will be harder to be implemented in SMEs [29].

The rest of this paper is organized as follow: Sect. 2 describes research proposed model and hypothesis development. Section 3 presents research model. Section 4 presents obtained results and following by discussion. Finally, Sect. 5 concludes this work.

2 Research Model and Hypotheses Development

This study is focused in SMEs in retail activities due to the difference in business type may affect IT implementation and performance [16]. Besides that, other studies have proved that non-financial performance in retail business can be assessed from service quality [30]. The factors that are likely to affects the implementation of IT in SMEs are AIS sophisticated, owner commitment, and external IT expertise. The Model of this study (Fig. 1) is a development from previous studies that explain the relationship between organizational factor and situational factor with IT alignment [11, 13, 14] as well as its effect on non-financial performance [22].

2.1 AIS Sophisticated and AIS Alignment

Company, regardless of its size, will face competition to protect its existence. To face the competition, SMEs must implement the technology [17]. In supporting managers' decision and increase the number of customers and market share, IT sophistication is needed by companies [2, 18]. One of SMEs' limitation lies on the limited number of employees; if not the nonexistence of employees; who can develop IT, thus it needs a sophisticated technology that can provide various information. IT sophisticated is very needed by SMEs to follow the change in demand from customers [15]. The other findings show that SMEs that have implementing the IT will be easier to acquire IT sophisticated [14, 31]. SMEs must take an action so that IT alignment can support organizational objectives, thus the implementation of IT will improve firm efficiency [8]. Company needs a good information system to support their daily activities and operation. The addition of information system will improve the flexibility so that the company will be stronger and easier in achieving its objectives [32]. Tuanmat and Malcolm [10] find the evidence that SMEs in Malaysia use AIS to support the changes in manufacturing technology in order to improve their performance. Estebanez [17] states that SMEs in service industry in Spain use IT more intensive and is very dependent on IT sophisticated. Due to these facts, even with various limitations, there is a growing numbers of SMEs that implement IT [11]. Based on the findings above, the hypothesis is proposed:

H1: AIS sophisticated significantly affects AIS alignment in SMEs

2.2 Owner Commitment and AIS Alignment

Generally, the manager who responsible on SMEs company operation is the owner [33]. Because of that, owner's commitment is a very important factor for SMEs in implementing IT. Ismail and King [1] explains that, in various cases, the implementation of IT in SMEs is still less efficient, thus owner commitment on IT development is needed, high commitment will facilitate the company in selecting the technology that fit with their needs.

Generally, SMEs do not have IT expert or IT department, thus the owner has a very important role in creating IT alignment [11, 17]. SMEs owner who understand the function of IT will try to choose the one that fit to avoid over investment [13]. Owner who

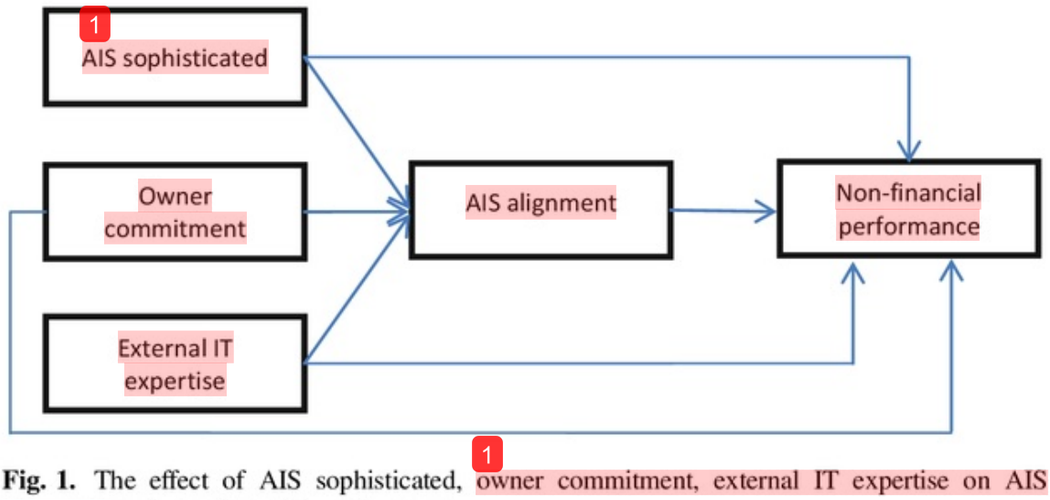

Fig. 1. The effect of AIS sophisticated, owner commitment, external IT expertise on AIS alignment and non-financial performance

has commitment in IT usage will make a good planning and evaluate IT usage in his company. Besides that, the success of SMEs is not assessed from company size only, but also can be viewed from the owner's capability in using IT [33]. Based on findings above, the hypothesis is formulated as follows:

H2: owner commitment significantly affects AIS alignment in SMEs

2.3 External IT Expertise and AIS Alignment

One of SMEs limitations in IT implementation is the limited number of human resource who understands IT. This limitation makes the implementation process is less optimal [7]. Thong [33] explains that one of the success factors for SMEs in the implementation of IT is the cooperation between IT consultants with the owner in integrating the information system in the company. Finding from previous studies show that SMEs owner and external IT expertise is two success keys that affect the implementation of IT [11]. The SMEs owners argue that IT can be used in a long period of time, thus external IT expertise is only needed when a crash take place. However, external IT expertise is still needed because most SMEs have not implemented the IT appropriately. It is strengthen by Ismail and King [13] finding that proved that external IT expertise affects the implementation of IT in SMEs. Based on above findings, the hypothesis is proposed as follows:

H3: External IT expertise significantly affects AIS alignment in SMEs

2.4 AIS Alignment and Non-financial Performance

The optimal implementation of IT will facilitate SMEs owner in managing their company so that they can compete more competitively because IT improvement is essential, even for a small company [17]. To face environmental uncertainty, several organizations have decided to invest in IT in the hope that it will improve the quality

and productivity [10]. Sousa *et al.* [9] explain that SMEs have tried to keep their quality to increase their performance. Company performance will be laudable if the system it used have a good synergy [8]. SMEs that use IT is expected to provide the information related with selling, earning, and cost. Information generated by IT has a potency to improve SMEs performance [16]. Based on description above, the hypothesis is formulated as follows:

H4: AIS alignment has a significant effect on SMEs non-financial performance

2.5 AIS Sophisticated and Non-financial Performance

Technology is an important resource for company to face a competition [3]. Investment in IT is an accurate way for company to make it stronger and more flexible [17]. Company will be able to respond quickly on customer's demand on qualified product as well as reducing its dependence on supplier through IT implementation [10]. Ismail and King [1] find evidence that SMEs that have information system that consistent with its needs have a better performance. Other studies, Soudani [32] finds evidence that AIS is very beneficial for SMEs and affecting organizational performance. Company needs IT to support its operation processes, an appropriate technology will support the company in achieving its objectives. In a large company, technology can be matched with requirement due to the existence of financial resource allocation. However, SMEs have a financial limitation, thus they have to choose an appropriate technology. Thus, to process daily transactions (selling and receivables) and monthly transactions (payroll and inventory calculations) SMEs need AIS that fit with its needs [16]. Based on above findings, the hypothesis is proposed:

H5: AIS sophistication has a significant effect on SMEs non-financial performance

2.6 Owner Commitment and Non-financial Performance

Owner commitment on technology advancement has a big role for SMEs in the success of IT implementation, especially AIS. Owner who has got used to operate technology will find it easier to plan and evaluate the need of IT in their company [34]. Owner commitment on technological advancement will motivate the employees to participate and feel that they are the part of company information system development process. Employees' participation in IT development process can reduce the failure in technology implementation process [4]. Based on above findings, the hypothesis is proposed as follows:

H6: owner commitment has a significant effect on SMEs non-financial performance

2.7 External IT Expertise and Non-financial Performance

Bledsoe and Ingram [7], Choe [22] develop a non-financial performance measurement that covers product quality, time for delivery, and customer's satisfaction. The improvement in quality and delivery speed is two problems that deemed very important

for company. Technological congruence can ascertain that company can maintain its product quality. Finding from previous study Amidu *et al.* [20] explain that SMEs need external IT expertise to develop its technology, especially for process and transaction in accounting cycle. External IT expertise will be needed when SMEs are unable to overcome the problems related with IT failure. Due to that reason, in IT development process, external IT expertise participation is very important. Besides that, SMEs owners believe that the technology they develop can be used in a long-term period, while in reality IT need upgrade which usually performed by IT consultant [16]. Based on findings of the literatures, the hypothesis is proposed:

H7: External IT expertise has a significant effect on SMEs non-financial performance

3 Research Method

The population in this study is all owners of SMEs in retail sector and has implemented IT in Yogyakarta. Based on the data from Industrial, Trades, Cooperation, and SMEs Agency (Dinas Perindustrian, perdagangan, Koperasi dan UKM), the number of SMEs in Yogyakarta is 1,429. For the convenience purpose, this study only focused on Sleman, Bantul, Kulon Progo, Gunung Kidul regencies, and Yogyakarta city. This study is employ retail business only to ensure the homogeneity of data. This study use purposive sampling (non-probability sampling) as sampling technique, the technique in which the samples are selected based on certain characteristics [35]. The characteristics used by the researcher refer to the Act No 5/2008 on SMEs that is have maximum 2.5 billion rupiah in term of sales per year, have 5–19 employees for small enterprises and 20–99 employees for medium enterprises. Before the questionnaire distributed to the respondent prior tests on small business owners and students research, some questionnaires were drop from the questionnaires list.

In this study AIS alignment is a match between AIS capacity and AIS requirement. The AIS alignment is measured by multiplying all items in AIS capacity and AIS requirement. The AIS requirement and AIS capacity is measured with 12 question items developed by Ismail and King [1] with 4 point scale, in which point 1 for "very disagree" up to point 4 "very agree". The indicators for the question are: focus, orientation, time horizon, aggregation, timeliness, financial, non-financial, quantitative, and qualitative [13]. In this case, high alignment results from high ratings for an AIS requirement and high rating for AIS capacity. The AIS sophisticated are a sophistication of an application in providing information so that it can fulfill SMEs owner. AIS sophisticated are measured using 11 question items on accounting application and supporting application for office activities developed by [13]. The questionnaire uses 4 point scales, point 1 for "unimportant" up to point 4 "very important". The owner's commitment is owner's strong will to keep using technology because he believes that technology is important factor for his business development. Owner commitment is measured using 15 question items related with information needs, hardware and software selection, system implementation, and planning for future usage of IT. The questionnaire for this variable is adopted from Hussin *et al.* [11] and Ismail and King [12] with 4 point scale, point 1 for "low participation" up to point 4 for "high participation". Referring to Thong and Yap [36], external IT expertise is

a person/company who assists SMEs in implementing IT, and oftentimes is a consultant/vendor who has an expertise in information system. The questionnaire for this variable consists of 5 question items related with external IT participation in hardware and software selection, training, and information system development. The questions are adopted from Ismail and King [1, 13] studies. The answer is stated in 4 point scales, point 1 for "do not participate" up to point 4 for "participate". Non-financial performance is measured using eight question items adopted from previous studies [22]. The answer is stated in 4 point scales, point 1 for "no information" up to point 4 "large information". The questions are related to the information about products failure/defects, product quality, number of returned products, number of defected supplies, lengths of cycle time from order to delivery and delivery.

4 Result and Discussion

This study is a survey study using questionnaire in data collection process. The sample is all owners of SMEs in Yogyakarta. The study is conducted in 4 months from January 1, up to May 30, 2015. The result of data from questionnaire is presented in the following Table 1:

Table 1. The result of returned questionnaire

Explanation	Quantity
(1)	(2)
The number of distributed questionnaire	= 300
The number of returned questionnaires	= 110
The number of defected/not meet the criteria questionnaire	= (23)
The number of questionnaires is able to analyzed	= 87

Based on Table 1 above, we can explain that there are 300 questionnaires sent to respondents. The questionnaires returned during the study are 110 questionnaires. Twenty three questionnaires cannot be processed further because of incomplete fillings. The usable questionnaires are 87 questionnaires with respond rate of 26%. The low response rate is due to the limited number of SMEs that have implemented IT. Besides that, this study only allocates four months to collect the data.

4.1 Results

An analysis of result by business classification of SMEs is presented in Table 2 and the level of IT adoption is presented in Table 3.

Validity testing is performed by reviewing the p value in the result of correlation testing using pearson product-momment. The Pearson correlation is calculates between each item of the questionnaire and the total score (total scores of AIS alignment). After the test of validity, for example is Table 4 (2 instrument X1.8 and X1.9 drop from the list), the next step is performing reliability testing. Based on Table 5, Cronbach alpha

Table 2. The classification of business

Classification	Region					Number of SMEs	Percentage
	Kota	Sleman	Bantul	Kulon Progo	Gunung Kidul		
Phone store	6	5	4	2	1	18	20.69
Drug store	2	3	3	2	0	10	11.49
Batik store	2	2	1	0	0	5	5.75
Accessories	2	4	1	0	0	7	8.05
Stationery	2	3	2	2	1	10	11.49
Minimarket	5	3	3	1	1	13	14.94
Spare part	2	2	3	0	0	7	8.05
Computer	7	3	4	3	0	17	19.54
Total	28	25	21	10	3	87	100

Table 3. Adoption level

Classification	Adoption level			Number of SMEs	Percentage
	Initiation	Diffusion	Integration		
Phone store	8	6	4	18	21.88
Drug store	10	-	-	10	12.50
Batik store	5	-	-	5	6.25
Accessories	7	-	-	7	9.38
Stationery	10	-	-	10	10.42
Minimarket	13	-	-	13	13.54
Spare part	7	-	-	7	8.33
Computer	10	5	2	17	17.71
Total	70	11	6	87	100

Table 4. Validity testing of X1 (AIS sophisticated)

	X1.1	X1.2	X1.3	X1.4	X1.5	X1.6	X1.7	X1.8	X1.9	X1.10	X1.11	Total
X1.1	1											
X1.2	0.320**	1										
X1.3	0.727**	0.351**	1									
X1.4	0.340**	0.567**	0.285**	1								
X1.5	0.954**	0.257*	0.748**	0.296**	1							
X1.6	0.316**	0.971**	0.304**	0.534**	0.271*	1						
X1.7	0.631**	0.310**	0.899**	0.213*	0.674**	0.303**	1					
X1.8	−0.111	−0.037	0.269*	0.400**	0.137	0.015	0.202	1				
X1.9	−0.061	0.143	0.175	0.048	0.086	0.164	0.067	0.483**	1			
X1.10	0.627**	0.246*	0.899**	0.198	0.670**	0.235*	0.942**	0.167	0.125	1		
X1.11	0.279**	0.490**	0.245*	0.937**	0.257*	0.472**	0.211*	0.482**	0.031	0.260*	1	
Total	0.747**	0.687**	0.757**	0.694**	0.731**	0.677**	0.740**	0.181	0.149	0.720**	0.675**	1

** Significant at $\alpha = 1\%$, * significant at $\alpha = 5\%$

Table 5. Reliability test

Variable	Number of Question	Cronbach Alpha	Explanation
(1)	(2)	(3)	(5)
AIS sophistication	9	0.892	Reliable
Owner commitment	13	0.871	Reliable
External IT expertise	5	0.793	Reliable
AIS Requirement	12	0.758	Reliable
AIS capacity	15	0.824	Reliable
Non-financial performance	7	0.816	Reliable

value for each variable is 0.892 for AIS sophistication; 0.871 for owner's commitment; 0.793 for external IT expertise; 0.758 for AIS requirement; 0.824 for AIS capacity; and 0.816 for non-financial performance. Reliability testing on all variables shows Cronbach alpha value greater than 0.6, this shows that all instruments are reliable and can be analyzed further.

This study uses three regression models to test the hypotheses. Model 1 is used to test hypothesis 1; hypothesis 2; hypothesis 3 with AIS alignment as dependent variable. Model 2 is used to test hypothesis 4 with non-financial performance as dependent variable. Model 3 is used to test hypothesis 5, hypothesis 6, and hypothesis 7 with non-financial performance as dependent variable. The results of hypotheses testing on the effect of AIS sophisticated, owner commitment, and external IT expertise on AIS alignment and non-financial performance is presented in Table 6.

Table 6 below shows the result for hypothesis 1, hypothesis 2, and hypothesis 3 which test the effect of AIS sophisticated, owner commitment, and external IT expertise on AIS alignment.

Table 6. Result of Regression Testing

Explanation	Model 1	Model 2	Model 3
	Coef. β (sig)	Coef. β (sig)	Coef. β (sig)
AIS sophisticated (x1)	0.334 (0.002)**		0.265 (0.009)**
Owner commitment (x2) External IT expertise (x3)	0.213 (0.041)* −0.038 (0.707)		0.250 (0.014)* 0.183 (0.072)
AIS alignment (Y)		0.382 (0.000)**	
F value	6.189 (0.001)*	14.495(0.000)**	0.000**
Adjusted R^2:	0.153	0.136	0.196

** Significant at α = 1%, * significant at α = 5%

The result of F-test shows F value of 6.189 with significant value of 0.001 and adjusted R^2 of 0.153. This shows that the independent variables can explain 15.3% of variation in dependent variable. The further testing on hypothesis 1 shows p value for AIS sophisticated of 0.002 (significant), owner's commitment has a significant effect on AIS alignment with p value of 0.041 (significant), external IT expertise has no a significant effect on AIS alignment with p value of 0.707 (not significant), thus hypothesis 1, 2 are supported while hypotheses 3 is rejected. Testing on model 2 acquires F value of 14.495 with p value < 0.001 (significant) and adjusted R^2 of 0.146. AIS alignment has a significant effect on non-financial performance with p value < 0.001 (significant). From the result of hypothesis testing we can conclude that AIS alignment has a significant effect on non-financial performance (hypothesis 4 is supported). Testing of model 3 acquires p value on AIS sophisticated of 0.009 (significant); owner commitment of 0.014 (significant); external IT expertise of 0.072 (not significant). From the results of testing on model 3 we can conclude that hypothesis 5, hypothesis 6 are supported while hypothesis 7 is rejected.

4.2 Discussion

This study results show several important findings that can be discussed. The first finding supports contingency theory as in Ismail and King [12] study that is AIS sophisticated, owner commitment affect AIS alignment. This finding is not surprising because previous study has proved that SMEs have tried to implement IT according to their needs [11]. The other results, Ismail and King [13] explain that SMEs in Malaysia that implement "analytical-based applications" find it easier to gain AIS alignment. The implementation of sophisticated technology will strengthen the company's position in the competition. Sophisticated technology will facilitate SMEs to perform accounting transaction such as selling, receivables, supplies, and payroll [17]. Furthermore, owner's commitment is an important factor in AIS implementation because owner has an important role in strategy planning for SMEs development [11]. Owner that understand the importance of technology is more prone to follow changes and make a good planning, thus technology can be implemented appropriately [6]. The adoption technology will provide accurate information as a base for decision making [12]. The last factor that affects AIS alignment is external IT expertise. With the limitation in human resource field, assistance from external parties, either consultant of government can help SMEs achieve better alignment, however using external IT expertise will increase SMEs cost. Second finding shows that most of the SMEs (80%) are in initiation level, which means that most of the SMEs have not utilize IT maximally, IT planning and control is still limited. Moreover, the SMEs in diffusion level (12%) and integration level (8%) are the SMEs that sell IT related commodities (computer store & phone store). This result provides an interesting material to be further studied, especially on owner's understanding on IT benefits. There are two possibilities related with this problem, first, the owner understand that IT is an important factor but do not implement it, and second, owner uses IT according to company's necessities to hold IT investment cost to minimum. The third finding, the direct effect of AIS sophisticated, owner commitment, and external IT expertise on non-financial performance (Fig. 2). This is quite surprising because previous study Budiarto, [16] find that AIS alignment

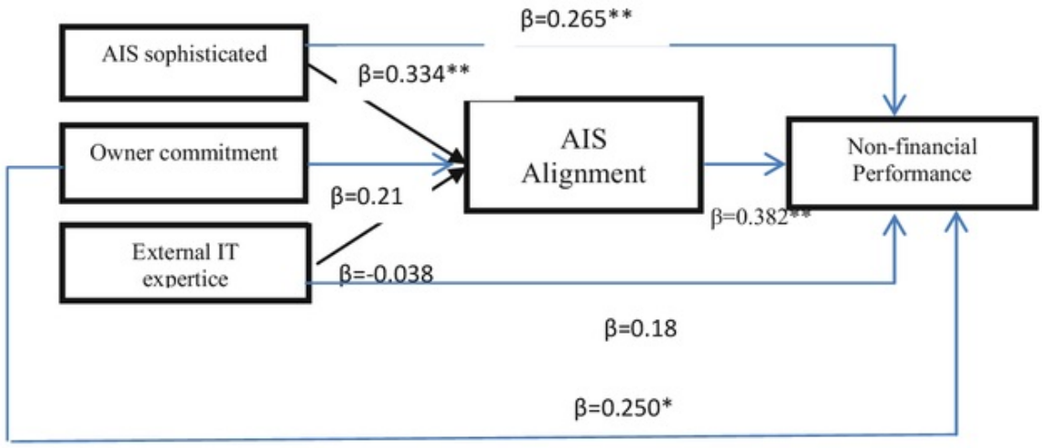

Fig. 2. The relationship between AIS sophisticated, owner commitment, external IT expertise, and non-financial performance.

is intervening variable that affects non-financial performance. This finding becomes a challenge for future studies to test the factors that affect SMEs performance.

Development in SMEs is not determined by its size but more on owner's role and ability in IT knowledge [33]. Owner must follow IT development and utilize IT optimally, especially for planning and strategy formulation [37]. SMEs owner that has a good understanding on technology will try to encourage their employees to participate in IT implementation, thus employees will feel that they become an important part in the company Dubihlela and Rundora [4] which in turn will improve their performance [31].

This study has several limitations that become a gap for future studies. The first limitation is this study proved that most of the SMEs are in initiation level where the owner has an excessive authority in IT implementation, this shows that IT has not implemented optimally in SMEs. Future research should study the IT implementation level further, because IT alignment relates with SMEs performance [1, 16]. The second limitation is this study does not test whether SMEs that selected as samples are private companies or family controlled companies. According to Chu [38], only small and family owned SMEs that have a better performance. The third limitation is the measurement of non-financial performance which only employs broad-scope, timelines, and aggregation indicator, without using integration indicator due to the SMEs selected as samples do not have division in their company. Future studies can develop the study samples to include SMEs with multiple divisions so that integration indicator can be implemented.

5 Conclusion

The analysis results show that all hypotheses proposed in this study are not supported. Besides having an effect on AIS alignment; situational factors and organizational factors also have a direct effect on non-financial performance. The testing on model 1

shows that AIS sophisticated, owner commitment has a significant effect on AIS alignment while external IT expertise has no significant effect on AIS alignment. This result is in line with [1, 11]. The testing on model 2 shows that AIS alignment has a significant effect on non-financial performance. This result is in line with [16]. The testing on model 3 shows that AIS sophisticated, owner commitment has a significant effect on non-financial performance while external IT expertise has no significant effect on non-financial performance. The result of testing on model 3 is in line with contingency theory explained by previous researchers [10].

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